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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/787,450	02/26/2004	Garo J. Derderian	2269-4097.1US (97-1252.01)	7825
24247	7590	01/09/2006	EXAMINER	
TRASK BRITT P.O. BOX 2550 SALT LAKE CITY, UT 84110			MALDONADO, JULIO J	
			ART UNIT	PAPER NUMBER
			2823	

DATE MAILED: 01/09/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/787,450

Applicant(s)

DERDERIAN ET AL.

Examiner

Julio J. Maldonado

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 24 October 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 27 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 27 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Allowable Subject Matter*

1. The indicated allowability of claim 27 is withdrawn in view of the newly discovered reference(s) to Xing et al. (U.S. 6,090,697) in view of Hu (U.S. 5,633,200).

Rejections based on the newly cited reference(s) follow.

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Xing et al. (U.S. 6,090,697) in view of Hu (U.S. 5,633,200).

Xing et al. (Figs.2 and 9a-9f) teach a method of forming a semiconductor device including providing a substrate (200); covering said substrate (200) with an insulating layer (900); etching a hole through said insulating layer (900) to said substrate (200); partially plugging said hole with doped polycrystalline silicon (904); forming at least one metal layer (906, 908, 910) over said doped polycrystalline silicon (904), wherein said forming of said metal layer (906, 908, 910) includes forming a titanium silicide layer (906) by depositing a titanium layer over said doped polysilicon layer (904) and annealing said titanium layer to form said silicide layer (906), forming a tungsten nitride layer (908) on said silicide layer (906), and forming a tungsten layer (910) over said tungsten nitride layer (908); and forming a semiconductor device (912, 914, 916, 918)

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over said metal layer (906, 908, 910) (column 4, line 2 – column 5, line 18 and column 10, line 6 – column 11, line 7).

Xing et al. fail to teach forming the tungsten nitride layer by a process that includes nitridizing a metal layer. However, Hu (Figs.3-4) teach a method of forming a tungsten nitride layer (26) including depositing a tungsten-rich tungsten nitride layer (20) on a surface (18) made of aluminum, polysilicon, titanium or any suitable material for semiconductor applications (column 3, lines 34 – 42); and nitridizing said tungsten-rich nitride layer (20) (column 3, line 1 – column 4, line 44 and column 7, line 36 – column 8, line 23).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Xing et al. and Hu to enable forming the tungsten nitride layer of Xing et al. according to the teachings of Hu for the further advantage of forming a tungsten nitride layer having low stress to adjoining layers, a high surface smoothness, and a high thermal stability (Hu, column 4, lines 40 – 44).

### ***Response to Arguments***

4. Applicant's arguments with respect to claim 27 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

5. Applicants are encouraged, where appropriate, to check Patent Application Information Retrieval (PAIR) (<http://portal.uspto.gov/external/portal/pair>) which provides

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applicants direct secure access to their own patent application status information, as well as to general patent information publicly available.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner Julio J. Maldonado whose telephone number is (571) 272-1864. The examiner can normally be reached on Monday through Friday.

7. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Smith, can be reached on (571) 272-1907. The fax number for this group is 571-273-8300. Updates can be found at <http://www.uspto.gov/web/info/2800.htm>.

Julio J. Maldonado  
Patent Examiner  
Art Unit 2823

Julio J. Maldonado  
December 29, 2005

  
George Fourson  
Primary Examiner